

Discussion

The applicant has amended the claims in their entirety. Claim 14 of the new claims as set forth in Schedule A corresponds to original Claim 8. The applicant has also introduced into the disclosure text to support the language of the claims as now presented. The amendments being made to the disclosure do not add any new matter.

One object of the amendments is to provide antecedents for new language used in the claims. For example, the claims now refer to a "mid-section" of the barrel portion of the bat, and the distal and proximal ends of the barrel portion. Additionally, the claims clarify that the radial stiffness parameter is the radial stiffness of the barrel wall. In some claims, reference is made to a stiffener being combined collectively with the barrel wall to produce a collective stiffness value.

One proposed amendment to paragraph [0062] reads as follows:

"The barrel portion's effective wall thickness in the mid-section can be greater by 5% over the thickness of the barrel in the lateral, adjacent portions. Conversely, the barrel wall's thickness beyond its central portion, in the lateral regions proceeding towards the end portions of the barrel, may be at least 5% thinner than the thickness of the barrel wall in the mid-section."

This passage is based on original Claim 13 as initially filed with the application and reflects the meaning inherent in that original claim.

Turning to the substance of the inventor's contribution, this invention takes a new direction in the design of bats. Its main object is to reduce the performance of a bat over a region of the barrel portion, with a concurrent improvement in the width of the "sweet spot". An innovation of this nature has been made possible by the advances in bat performance. With batting performance now having achieved levels which can be higher than allowed by regulations, the opportunity for enlarging the sweet spot zone on a bat has been made available.

As is well understood, other parameters being held constant, bat performance is generally inversely proportional to the radial stiffness in the barrel wall of a bat, provided that elastic limits on deformation are not exceeded. A barrel wall with lower radial stiffness will flex more on striking the ball, delivering higher bat performance. The object of the present invention, however, is to increase the radial stiffness along the wall of the barrel portion in the region containing the sweet spot, thereby decreasing bat performance in this affected region. A benefit of this procedure is the enlarging of the dimensions of the "sweet spot".

As described in the Disclosure, one basic feature of the invention is to increase the radial stiffness of the central region or mid-section of the barrel wall of the bat. This may be done in a variety of manners. These include:

- by forming the barrel wall of inherently stiffer material within the mid-section,
- by making the barrel wall thicker within the mid-section, or
- by providing a supplementary stiffener along the mid-section of the barrel, either on the inside or on the outside surface of the barrel wall.

At the same time, the objectives of the invention include continuing to minimize bat weight while providing a bat which is fully functional in terms of strength, durability and performance.

By way of contrast, prior art modifications of bat barrels, primarily double-wall bats, through use of secondary members such as inserts and the like, have all been directed to strengthening bats to provide adequate durability and/or improving performance by increasing the trampoline effect resulting from lowering the radial stiffness along the entire barrel length. There has even been a reference to the effect of such secondary members on the sweet spot. In prior art patent US 6,042,493 to Chauvin filed on May 14, 1998 and issued March 20 8, 2000 the pre-existing consensus is reflected in the following paragraph (column 1 line 32):

"The object of using reinforcing inserts is to increase the compliance (flexibility) of the bat while simultaneously controlling the stress in the outer shell. That is, the reinforced bat is more compliant (or flexible) and can deflect more before experiencing permanent set or yield (that is, before it is dented). A more compliant bat is said to enhance player comfort and performance by reducing the amount of sting that can be experienced during ball impact. A more compliant bat is also said to have a wider "sweet spot." (Emphasis added)

By way of contrast, the present invention, by stiffening a local region generally in the mid-section of the barrel portion, the dimensions of the sweet spot are enlarged, a primary objective of the present invention. Thus the result of the present invention is achieved by proceeding in the opposite direction to the prior consensus that the sweet spot dimensions are determined by bat wall compliance. Previously, bats were made more compliant, e.g. decreasing radial stiffness along the entire length of the barrel wall, in order to increase bat performance and widen the sweet spot. In the present invention the radial stiffness in the central region is increased in order to decrease bat performance and widen the sweet spot.

These and further features of the invention will be apparent in the review of the prior art which now follows.

Applied Prior Art

The examiner had rejected claims 1-3, 5-7, and 12 under 35 USC 102 (b) as having been anticipated by Easton, US 5,364,095. The inventor in this referenced patent is explicit that he intends to produce a metal bat having a very high rate of wall recovery during impact. This is

achieved by providing a reinforcing member in the form of a hollow sleeve that fits within the tube of the barrel portion of a thin walled metal bat. The outside dimensions of the sleeve and the inside dimensions of the tube on assembly are such that the compressive forces generated between the inside wall of the tube and the outer wall of the sleeve locks the sleeve in the tube and provides the ball-striking area of the bat with a high rate of wall recovery during impact. In particular, this construction enables the use of a very thin aluminum wall in the ball-striking portion of the bat, resulting in a bat of lighter weight and lower inertia than in the prior art metal bats.

The object of Easton in his patent differs substantially from the object of the invention in the present patent. By way of contrast, as indicated in paragraph [0016] of the present application:

"A main object of the present invention is to provide bats... with changed (usually decreased) bat performance..."

This is achieved by stiffening the peak bat performance area, which is the mid-section of the barrel portion that includes the "sweet spot". Stiffening the mid-section of the barrel portion but not the lateral regions on either side of the mid-section has the result of enlarging the dimensions of the "sweet spot", an important consideration for players, while decreasing bat performance.

New claim 14 does not read on Easton. Easton does not meet the limitations, *inter alia*, of having:

- c) a mid-section within the barrel portion, the mid-section being of shorter length than the length of the barrel portion and including the sweet spot area;
- d) two lateral regions extending on either sides of the mid-section towards the distal and proximal ends respectively, and
- e) a radial stiffness for the barrel wall at each location along the length of the barrel portion,

the radial stiffness of the barrel wall being greater in the mid-section of the barrel portion than in the two lateral regions of the barrel portion.

The secondary member described in Easton extends for the greater part of the length of the barrel portion and Easton does not teach providing the lateral regions where the barrel wall is of reduced stiffness which is a key feature of the present invention. Therefore claim 14 is not anticipated by Easton. Nor do the claims dependent on Claim 14 read-on an obvious variant on Easton. Accordingly, claims 14 and all claims dependant thereon are patentable over Easton.

The examiner had rejected claims 8 and 9 (now corresponding to claims 14, 15 and 24) under 35USC102(e) in view of Vacek. Vacek is a pending application that was filed on May 12th, 2004. This filing date is after the filing date of the present application. Vacek claims divisional status from an earlier application filed May 14, 2003 and further continuation-in-part status from an even earlier application. However, there is no indication as to whether the subject matter that the examiner relies upon was present in these earlier filings. The applicant's attorney has been unable to access the earlier filings at the USPTO web site. Accordingly, the applicant submits that Vacek is not an applicable reference against the present application. Nevertheless, the effect of Vacek on a hypothetical basis will now be reviewed.

Vacek aspires to provide a polymer composite-based bat which:

" ...hits farther than a wooden or metal bat or bat having metal parts. The additional flexibility of the composite material forms a bat with higher performance which hits better."

And,

" The trampoline effect of the sleeve 112 further enhances the hitting zone of the bat 100 and provides additional velocity to the ball when hit by the bat 100. The trampoline effect provides distance to a particular hit."

Again, this reference is directed to improving the performance of a bat having a typical prior art barrel wall. This is the opposite objective to that of the present invention. The secondary members described in Vacek extend for the greater part of the length of the barrel portion and Vacek does not teach providing lateral regions of reduced stiffness which are a key feature of the present invention. Claim 14 and the claims dependent thereon are distinguishable from Vacek by reason of the same limitations recited in respect of Easton, above.

In respect of claims 26 and 27 as now pending, these claims stipulate for the supplemental stiffening sleeve to be bonded to the barrel portion of the bat. This is a feature not contemplated in the Vacek references. This is a further grounds for distinguishing these claims from the cited Vacek reference in respect of these specific claims. Another reference, US 6,042,493 to Chauvin does propose bonding an insert laminate in place, but does not do so in the context of the limitations of claim 14. There is no teaching in this latter reference that the referenced metallic sheet(s) should be located in a mid-section of the barrel portion with the barrel wall being less rigid on either side. Therefore, there is no teaching that the radial stiffness of the barrel wall on both sides of the mid-section be less than the radial stiffness of the barrel wall in the midsection.

The examiner had rejected prior claim 13 as being obvious under 35 USC 103(a) in view of Easton. Claim 13 had stipulated that the barrel thickness was at least 5% thinner in the end portions than in the central. The examiner observed that Easton failed to disclose the relative thickness of the

barrel and barrel portion including the reinforcement, but submitted that selection of the exact thickness would have been obvious. Corresponding new claims 19, 20, 21 and 40 include the limitation that the:

"... thickness of the barrel wall in the mid-section is greater than the thickness of the barrel wall in the lateral regions.."

This includes both regions, on either side of the mid-section, a limitation not met or suggested by Easton. Claims 19, 20, 21 and 40 do not simply address a particular thickness, but stipulate for a difference in thickness along specified regions of the barrel portion of a bat, on both sides of the mid-section. Further, these claims are subject to the limitations of Claim 14. Accordingly, Claim 16 and the claims dependent thereon, should not be rejected under 35 USC 103(a) over Easton.

Examiner had rejected prior claim 4 is being obvious under 35 USC (a) in view of Fritzke. Claim 4 provided the limitation that the stiffener present in the bat has a length less than 50% of the barrel portion length and added less than 2 ounces to the bat weight. The corresponding new claims in respect to the length ratios are Claims 33, 34, 35, 42, 43, 44 and 45. The examiner's objection was directed only to the weight and strength characteristics of claim 4. Allowing for the further limitations of claims 14 and 40, and all claims dependant thereon, that only the mid-region is affected by the presence of a thickened region, a continuing rejection of Claims 14 and 40, and all claims dependant thereon and other under 35 USC 103(a) on the basis of Fritzke would no longer be appropriate.

Additionally, Fritzke specifically states:

"The composite layer provides several advantages, including improved durability with little or no reduction in performance."

And,

"The present invention, however, overcomes these shortcomings by combining the elasticity and isotropic shear strength of the tubular sleeve (at the center of this load bearing member) with the circumferential strength of a thin composite material (at the outer surface of the load bearing member) to produce a bat with improved durability and little or no reduction in performance."

"The present invention provides greater resistance to localized plastic deformation of the impact portion because the thin composite material gives the impact portion greater strength in the circumferential direction. Yet, the composite material does not significantly restrict elastic deflection in the longitudinal direction, allowing the insert to retain its leaf-spring capacity to transfer energy back to the ball as it leaves the surface of the bat."

Accordingly, this reference does not teach the invention as claimed herein.

The examiner had rejected old Claims 10 and 11 as being obvious under 35 USC 103(a) in view of Vacek and Fritzke. The applicant reasserts that Vacek is not a citable reference, nevertheless, new Claims 14, 37, 29, and 40, and all claims dependant thereon, specify for a polymer composite baseball bat wherein the radial stiffness of the barrel portion is highest in the mid-area and lowest towards the ends of the barrel portion, with graduated changes in stiffness from the mid portion to each end portion. In this latter respect, the examiner refers to Figure 15 of Fritzke as indicating that it is known to vary the stiffness of a barrel wall in uniform increments proceeding towards each end. With respect, such a teaching is not provided by Fritzke. Paragraph [0077] of Fritzke refers to thickness, but he teaches that his modifications do not affect stiffness and performance (see quotes above).

Nowhere in Fritzke is there any understanding that the insert he proposes may be positioned so as to enlarge the sweet spot dimensions within the barrel portion. What is missing from this reference is a clear teaching that the stiffened area is of such a dimension and character as to broaden the sweet spot. This is because the inventor in that document did not contemplate the objective of broadening the sweet spot.

For the purposes of the present application, and without prejudice to the right of the applicant to file continuation applications, claims 22 through 29 include the limitations that the supplementary stiffening insert is: "...positioned along the mid-section of the barrel portion adjacent the inner or outer surface of the barrel portion". Thus these claims do not read on the configuration proposed in this Fritzke reference which is to place stiffeners between the inner and outer members, which is consistent with Fritzke's objectives of little or no reduction in bat performance. Nor is there anything in this Fritzke reference to suggest the positioning addressed by these claims.

Accordingly, this document should not constitute prejudicial prior art, either in respect of novelty or obviousness for the claims as now pending.

A further application by Fritzke published August 5, 2004 as publication number 2004-0152545 clearly recognizes the possibility of modifying the dimensions of the sweet spot. The issue fee on this application was paid on May 18, 2005. This Continuation-in-Part application by Fritzke was filed on January 21, 2004, claiming CIP status from the cited application serial number 10/033,805 filed December 8, 2001 (now US 6,733,404). Further, that filing was a Continuation-in-Part of serial number 09/396,700 filed September 15, 1999 (now US 6,497,631). It is to be noted, however, that the first occasion when the "sweet spot" issue, and the thickness of the primary and/or secondary members is addressed in this series of filings occurs in the application filed January 21, 2004. The application of the present invention under examination was filed on September 29, 2003.

The absence of an earlier recognition of the importance of the "sweet spot" and thickness issues in this string of references argues strongly that this concept, as conceived by the present inventor and now defined in Claim 14 and the claims dependent thereon, was an inventive advance, at least as of the filing date of the present application, September 29, 2003, and even previously thereto. Accordingly, rejection of the presently pending claims on the basis of 35 USC 103(a) would be inappropriate.

The applicant has introduced a new set of claims that focus substantially on the features previously addressed by Claim 8 and claims following as originally filed. An effort has been invested to demonstrate how these new claims are distinguishable over the prior art cited earlier by the examiner. In view of the features and limitations of the new claims, it is submitted that the applicant is seeking coverage which is both novel and unobvious over the cited references, and over the prior art generally. Accordingly, reconsideration and a favorable ruling which will allow this application to advance to Allowance is therefore requested.

Respectfully submitted,

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per


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